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# Humans of Machine Age: Management Strategies for Redundancy

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**Abstract:** The main premise of this paper is that digitalization would perish human skills and perpetuate inequality since it increases redundancy. The majority of future humans may turn into vagabond and aimless beings owing to the reality that machines will take over their jobs. Basic living stipend which is regarded as a solution for widespread unemployment would result in chronic redundancy. Moreover, it is also not a remedy for the inequality which stems from the dynamics of post-digital ecosystem. Abundance economy would not mean equal well-being as proposed optimistically by some scholars. Rising machine intelligence will bring about unexpected consequences. In the future, governments may have to consider how they manage redundancy and inequality. Widespread unemployment and inequality in the post-digital ecosystem would indirectly exert pressure on the profitability of enterprises; therefore, it falls within the scope of business management as well. In the light of such developments, this paper aims to spark discussions on the paradoxes of management in the post-digital ecosystem.

**Keywords:** Digital Economy, Management, Unemployment, Artificial Intelligence, Future

## 1. Introduction

Widespread automation and artificial intelligence technologies enable the business processes around the world to require less labour force (Ford, 2009). Especially with the advent of technologies such as the Internet of Things (IoT), business processes have begun to be integrated seamlessly (Uckelmann, Harrison, & Michahelles, 2011). Effective and efficient production processes are expected to bring abundance; on the other hand, it is also possible that they would lead to a crisis because people who demand products are losing their jobs. Enterprises are much more productive today but competition in the environment is higher than before. As a consequence, this phenomenon can be regarded as a vicious cycle (Civelek M., 2009). In the current

capitalist economic system, there is not a solution to this problem. This phenomenon, namely digital economy, can be defined as a new economic system in which increase in productivity and decrease in costs occur as a result of automation technologies (Civelek M., 2009). In digital economy, information has been transformed into the most important production factor; and in this context, the importance of other factors is gradually diminishing. For example, digital economy company Facebook that has achieved to reach a great market value had small initial capital compared to its current market value. It is also hiring small labour force compared to its revenues obtained. Capital and labour have gradually lost their importance (Ford, 2015). The digital economy has also exerted its impact on the habits, lifestyles, views and perceptions of individuals. Considering both the economic and social aspects, it would be apt to define it as a new ecosocial system. The term of new ecosocial system was firstly suggested by Civelek and Sözer in 2003 (Civelek & Sözer, 2003). However, beyond the new ecosocial system, humanity is awaiting a new system that can be called as the post-digital ecosystem. The term of post-digital ecosystem was discussed by Sözer, Civelek and Çemberci in 2018 (Sözer, Civelek, & Çemberci, 2018). The transition from the new ecosocial system to the post-digital ecosystem may be agonizing, with some dystopian scenarios having recently sparked debates on the future of the world economy.

At the end of the 18th century, technology-related unemployment was initially discussed by British handweavers who aimed to destroy textile machines because they had the fear of losing their jobs. This movement was called Luddism and the term Luddite came to be used to define a person who opposes technology (Van Der Wal, 2017). Accordingly, machines created new jobs; therefore, they fell into a fallacy. Hence, some scholars called this incident as Luddite fallacy. Technology-related unemployment was also mentioned by John Maynard Keynes in 1930. He discussed technological unemployment in his essay entitled *Economic Possibilities for our Grandchildren* (Keynes, 1931). Contrary to Schumpeter's creative destruction, he regarded technological unemployment as a disease which inflicts—humanity. Nevertheless, he was optimistic in that he suggested that there would be no need to work in the future abundance economy. He called the future as the age of leisure. However, Schumpeter argued that unemployment caused by innovation would recover over time (Schneider, 2017). Like Keynes, Rifkin also depicted future as abundance economy. According to Rifkin, production is gradually transforming into customized decentralized production in small units rather than Fordist central mass production performed in big plants. People will be able to produce some products in their own facilities. People can also produce free energy in their houses. Three-dimensional

printing technologies have also evolved and reached an affordable level. With this development, people have started to use this technology in their houses (Rifkin, 2014).

While considering the dynamics of the post-digital ecosystem, it is not possible to be optimistic about the future in the same way as in the views of Keynes and Rifkin. To some extent, they may be right because the obstacles against abundance economy which are explained hereunder can be cleared in the future; and collectivist approaches like sharing economy will also pave the way to abundance economy. These obstacles which are the factors that play a role in increasing costs of the production will be removed in the future. Yet, abundance economy per se would not suffice to reverse the dynamics of the post-digital ecosystem.

The obstacles mentioned above may be divided into four. The first obstacle is the human labour force – In the short run, to some extent, human power will be required for the production of goods. However, in the long-run, particularly in some sectors, the need for the human will disappear. The second obstacle is the energy – In order to produce products from natural resources, energy must be consumed. Today production of energy is repressed by the scarcity of the natural resources and this results in environmental problems. Today, renewable energy and nuclear energy technologies are continuously evolving and in the long run, energy needed for production would be supplied freely without causing environmental problems. In this regard, renewable energy facilities have evolved and attained a feasible level. Apart from obstacles related to human labour and energy, another obstacle, namely the third one, is the logistics – Transportation of the products from the place of production to the place of consumption increases the costs of the products. In the future, Internet of Things (IoT) applications, 3D printers, renewable energy and autonomous driving technologies would make logistics processes highly efficient. Following logistics, the fourth obstacle is the capital – Today, in the capitalist economic system, businesses should generate profits in order to return capital which is initially invested into the businesses. In the post-digital ecosystem of the future, governments may intervene in the production processes regarding some vital products, which will then cause the profit pressure to be removed from the price.

When these obstacles are removed, marginal costs of certain products would almost converge into zero, which is the start of abundance economy. Yet, it cannot be stated that it will bring the problems to an end. The problems that have arisen from the dynamics of the post-digital ecosystem may continue to exist. Under such circumstances, it is likely to encounter management problems that stem from

redundancy. The next section will provide an explanation as to the dynamics of the post-digital ecosystem.

## 2. The Dynamics of the Post-Digital Ecosystem

In the post-digital ecosystem, new technologies may eliminate many business lines and the remaining lines will, in turn, require less labour force compared to the classical ones. Therefore, innovations do not create the same amount of jobs as suggested by Schumpeter. Technological developments cause product life cycle to get shorter (Gupta & Wilemon, 1990). Besides these developments, competition and uncertainty in the business environment also increase. Unpredictable changes in demands and preferences of customers have taken place as well. In such a business environment fraught with chaos, customers have become more active than ever and demand for products and services are increasingly becoming ambiguous (Civelek, Çemberci, Kibritci Artar, & Uca, 2015).

At the very beginning of the 1990s, digital divide was started to be associated with the Internet penetration on the basis of technology diffusion theory (Zhou & Salvendy, 2015). Digital divide was recognized as a threat to the public with the advent of the internet (Norris, 2001). Today, digital divide essentially refers to the inequality between people who have and have not accessed to the internet (Danesi, 2013). It was anticipated that digital divide would decline as the internet use would increase globally. Yet, the divide has triggered other unbridgeable inequalities. There are three consecutive dynamics which accompany to the digital divide as shown in Figure 1. These dynamics constitute the basic mechanism behind the vicious cycle caused by automation technologies. These dynamics are the main drivers of the post-digital ecosystem. The dynamics of the post-digital ecosystem were initially defined by Civelek in 2009 as dynamics of the internet age. Increased productivity causes unemployment and it consequently causes demand uncertainty. This situation was described as a vicious cycle by Civelek in 2009 (Civelek M. E., 2009). The same phenomenon was also mentioned by Martin R. Ford in 2009. In his book, *The Lights in the Tunnel: Automation, Accelerating Technology and the Economy of the Future*, Ford suggested that the increase in unemployment causes decrease in the purchasing power of the consumers (Ford, 2009). Correspondingly, the dynamics of the post-digital ecosystem constitute the basis for this vicious cycle. Fundamental philosophy of current capitalist economy depends upon inequality (Jwa, 2017). Therefore, the vicious cycle will continue to loop until the collapse of capitalism.

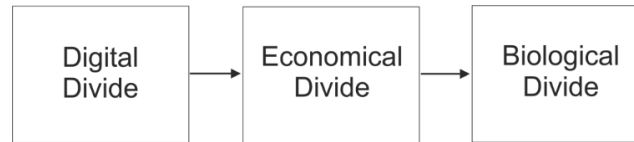


Figure 1. The dynamics of the post-digital ecosystem (Civelek M., 2009)

Digital divide results in imbalance with regard to access to information. In the post-digital ecosystem, information is the most important production factor. Therefore, the imbalance in access to information causes unequal income distribution. In the long-run, however, solving the unequal income problem will be much more difficult than closing the information gap. In addition, there is a strong relationship between the income level and internet access (Kramarae & Spender, 2000). Income is also related to broadband connections (Green, 2010). People on the negative side of the digital divide are mostly those who have lower income (Azari, 2003). Individuals who have good economic status can have access to information more effectively. Due to the fact that information is an essential production factor in post-digital ecosystem, the economic divide has widened. The wage gap between technology intensive industries and labour intensive industries is widening as well. All the routine and repetitive works have recently been taken over by machines. Therefore, demand for labour has decreased in labour intensive industries. Only individuals who have mastered information technology will have the opportunity to work, and all routine jobs will be left to the machines. Today, industrial workers are mostly responsible for the maintenance of machines. The same replacement is continuing in office works. In the future, however, most professionals such as those on the top management, or ones who are surgeons, engineers, and airline pilots can be replaced by machines (Fresco, 2007). The replacement unequivocally increases the surplus of human workers especially at the lower level of ability (Kaczynski & Skrbina, 2010). Concisely, individuals who use technology effectively become economically advantageous. As shown in Figure 1, the division between individuals begins with a digital divide resulting from the difference in technology use among individuals, and then turns into an economic divide. Individuals, who are economically strong, can attain a longer life opportunity in the future, owing to the progress in medical technologies. Economically strong individuals can thus lead a healthier life. This phenomenon has been named as the biological divide by Civelek in 2009 (Civelek M. E., 2009). By means of medical progress and invention of biotechnical applications, humanity is going towards immortality (Kurzweil, 2005). This phenomenon namely biological divide will eventually cause unpredictable social problems (Civelek M. E., 2009).

### 3. Revocation of Money

In the post-digital ecosystem, productivity increases due to the automation and artificial intelligence technologies. Subsequently, the increase in productivity leads to an increase in unemployment. Consequently, the purchasing power of the consumers decreases. This vicious cycle continues to loop until the collapse of the current economic system. As a palliative treatment, excess fiat money has been created and personal debt ratio of the consumers has been increased. The ratio of personal debt to disposable income has doubled in three decades (Foster & Magdoff, 2009). However, this monetary balloon only postpones the bitter end. Another remedy to make this collapse slowdown is the payment of basic living stipend to unemployed persons. Excessive debt creation of the current banking system has been argued and universal basic income has been proposed accordingly (Bheemaiah, 2017). Universal basic income refers to a stipend which is unconditionally paid to all individuals regardless of whether they have a job or not (Kaiden, 2016). The basic income idea was firstly suggested by Thomas Paine in 1797 in his book *Agrarian Justice* (Luzkow, 2018). Nobel laureate Milton Friedman suggested negative income tax in 1962. He proposed that all citizens with incomes below a certain level would be paid a basic guaranteed annual income by the government (Lang, 2007). There are some common objections to universal basic income. Increased burden on the budget of the government is the first argument. The second objection is its potential to cause inflation. Counter argument of these objections is that universal basic income causes Keynesian cross and increases the total national output. The subsequent objection stems from the main paradigm of the capitalist economy which is the poor people have to work to live. It is not fair because this paradigm is not valid for the rich people. But the spirit of capitalism depends upon this Weberian approach. Finally, the last objection asserts that it will make people lazy. However, none of these prove to be strong arguments (Standing, 2007).

Amount of the basic income should be determined in minimum level in order to prevent people from having lack of motivation for self-improvement and no aspiration for a better future. In this case, people will be willing to work to earn more. The government can use base income as a social control mechanism if it is to implement unequal payment according to the citizenship score. This score can differ depending on their contribution to the society and ethical behaviours. Until the unemployment rate reaches a certain level, the universal basic income will ensure the survival of the capitalist system. But when the number of unemployed people in the community exceeds the number of employees, it will accelerate the collapse of capitalism. With

this collapse, the main paradigm of the capitalist economy which maintains that poor people have to work to live will be removed.

Some scholars argue sharing economy as an alternative to the capitalist economy and use the name crowd-based capitalism for this new system (Sundararajan, 2016). After the collapse of capitalist system, classical money should be revoked and extracted from economic system. The excess fiat money created until the collapse of capitalist system will be null and void. Tax will also become a thing of the past in this post-digital ecosystem. Today some proponents of cashless economy offer blockchain technology as a decentralized alternative to banking system. As a disruptive technology, blockchain may radically change the money perception by eliminating third-party intermediaries and controllers such as banks and governments (Girasa, 2018). In this post-digital ecosystem, the definition of trade will also evolve. Trade in machine age refers to the exchange of the goods produced by machines in order to meet human needs. In this system, money will gradually be replaced by the importance of needs. Artificial intelligence trade matrix system will decide which products are exchanged. Determination of human needs will depend upon the intelligence of machines. If needed machines may change the needs of human, like manna mentioned in the Bible, our new gods may obligatorily provide us with the products that we require instead of the products we actually want. This means that machines will control our needs. But, machines will have to repeal our personal privacy right to ensure full control over humanity.

#### **4. Extinction of Privacy**

Privacy simply refers to “the right to be left alone, out of public view, and in control of information about oneself” (Bertsima & et al., 2015). Privacy concept has already existed before the digital age and can be defined as a natural reaction of individuals. But according to some scientists it is not natural. Naturally we are social creatures and live together. Privacy concept was learned after setting up complex civilizations (Rifkin, 2014). Therefore, from this angle, the extinction of privacy in the digital age can be considered as a reversion to the original nature of the human. With the development of the Internet of Things technologies and decreasing cost of sensors, the majority of people’s personal belongings will become connected to the internet (Rifkin, 2014). Toothbrushes, coffee makers, cars, alarm clocks, watches, headphones, etc. will all be connected to the internet in a few years’ time (Morgan, 2014). The emergence of this phenomenon has posed a threat to privacy. Across the globe, as the use of social media sites has increased, people have become more visible. Through social media

applications, people enjoyed increased personal influence but they should eventually trade off their privacy. Security and traffic cameras, biometric identification devices (including cellular phones), mapping softwares continuously collect personal information of people. Today, individuals are under total surveillance. Owing to big data analysis techniques, software companies like Google know people better than they know about themselves personally. Avoiding this total surveillance is almost impossible for an ordinary person nowadays. Consequences of total extinction of the privacy may be harmful to human's mental health. But, humanity has no choice other than surrendering to this phenomenon. People must accept to live in an open world because almost every communication, transaction and movement is constantly being recorded (Houle, 2018).

## 5. Conclusion

In future sharing economy, ownership of production facilities shifts from capital owners to decentralized collective structures or directly to individuals. Renewable free energy, ultra-cheap and effective transportation facilities, 3D printers and unmanned production by artificial intelligence increase the productivity unprecedentedly. Yet, on the other side of the coin, unemployment will reach an unprecedented level too. Widespread unemployment and relentless inequality in the post-digital ecosystem would indirectly exert pressure on the profitability of enterprises. Universal basic income will ensure the survival of the capitalist system for a while, but, so as to convert the vicious cycle into a virtuous cycle, government intervention to production will be inevitable. From this moment onwards, we will have to abandon the capitalist system. Consequently, an economic model that is more collective and open to government intervention will be needed. By means of moderate government intervention, inequalities that stem from the dynamics of post-digital ecosystem (i.e. digital divide, economic divide and biological divide) will be stabilized. As governments increase their influence on economy, companies will have to change their ownership and capital structure. More collective structures should be implemented by means of token economy and crowd financing. In this post-digital ecosystem, humanity will face the redundancy problem. According to Keynes' optimistic suggestion, there will be no need to work in the future abundance economy. He called the future as the age of leisure; however, he also regarded technological unemployment as a disease which inflicts humanity (Keynes, 1931). Government intervention to economy and universal basic income would end up with chronic redundancy. The redundancy would perish human species since it deters natural selection mechanism because struggle for the sources will be needless. Due to the relentless progression of full automation,



cognitive burden on humans decreases. This decrease has negative impact on the ability of think (Ford, 2015) (Carr, 2011). The majority of the future humans may turn into vagabond and aimless due to the fact that machines take over their jobs. Moreover, universal basic income is not an exact solution for the inequality stemming from the dynamics of the post-digital ecosystem either, it only serves stabilising them. Abundance economy would not mean equal well-being as optimistically proposed by some scholars. Rising machine intelligence will bring about further unexpected consequences. In the future, governments may have to consider how they manage redundancy. Universal basic income will break the paradigm of people having to work to live. Rational and self-interested homo economicus will die and homo collectivus of sharing economy will be born instead. Yet, most of the developed countries will suffer from their aging population. Homo collectivus will only need to be cared. Elder-care robots technology will also be developed. In the redundancy age, the need for care will turn into need for controlling aimless crowds, and this technology will start to provide care for the entire population. In addition, care will transform into control. Social control will increase by means of citizen scoring technologies and extinction of privacy. Citizen scoring technologies can be used as a coercive power on the population. In the future, people will most probably renounce management in favour of robots. But maybe, after a while, this administration can be ruthless. Although the rise of artificial intelligence will have dangerous consequences for humanity, it will not be possible to prevent this. It will not be a solution to slow these developments either. Countries which cannot succeed in raising abundance economy will struggle against serious economic and political problems. Under these circumstances, the following five key strategies can be suggested so as to facilitate the transition to a sharing and abundance economy:

The first strategy– Need for the human intervention to the business processes should completely be eliminated. In order to implement this strategy, governments should encourage investments with regard to artificial intelligence.

The second strategy – Energy should be supplied to the production centres free of charge. In order to implement this strategy, governments should invest in renewable energy facilities and allow the firms to produce their own energy.

The third strategy– Bringing transportation charges to a minimum level. Besides, waste of time due to transportation should be eliminated from the supply chain. In order to implement this strategy, governments should encourage investments in the Internet of Things, 3D printers, autonomous driving technologies and robotic warehouses, etc.

The fourth strategy– The importance of the capital among other production factors should be reduced. In order to implement this strategy, governments should intervene in the production processes. Then, profit pressure will be removed on the price of the products.

The fifth strategy– Measures need to be taken against economical divide. In order to stabilize economical divide, all citizens with incomes below a certain level would be paid a basic guaranteed annual income by the government.

These five strategies are important factors that will pave the way to abundance economy. Otherwise, huge political and social unrest will be inevitable in the transition from capitalist economy to abundance economy. Besides this, some economies will encounter total collapse and chaos. Yet, achieving to set up abundance economy is a new start for new problems related to redundancy. To cope with these problems, governments can use the base income as a social control mechanism. Furthermore, citizenship score can be measured; and base income can be adjusted accordingly, based on this score. In this way, it will be possible to encourage citizens to contribute to their society.

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